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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/043,367	01/09/2002	Min Xu	10541-640	6341

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EXAMINER

NGUYEN, DINH Q

ART UNIT	PAPER NUMBER
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3752

DATE MAILED: 06/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/043,367

Applicant(s)

XU, MIN

Examiner

Dinh Q Nguyen

Art Unit

3752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 7-9, 12 and 13 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 18-29 is/are allowed.
- 6) ☒ Claim(s) 1-6, 10, 11 and 15-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

### DETAILED ACTION

1. Claims 7-9, 12, and 13 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on March 31, 2004.

#### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 14 and 15 recite the limitation "the valve seat includes a second recess" in lines 1 and 2 of claim 14. There is insufficient antecedent basis for this limitation in the claim.

#### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2, 16 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Fuchs et al.

Fuchs discloses a fuel injector nozzle assembly comprising: an injector body including a valve seat 29 with a supply passage 15 through which fuel flows generally along a supply axis 2, the valve seat 29 presenting an upper surface adapted to engage a valve 8 to seal the supply passage 31; and a nozzle plate 23 mounted onto the valve seat 29 including a plurality of orifice holes 39 therein through which fuel flows; the valve seat 29 further including a first edge protrusion 31, protruding into the fuel flow for generating a first

Art Unit: 3752

separation of the fuel flow, thereby creating a plurality of small eddies which are entrained within the fuel flowing adjacent thereto; a turbulence cavity 35 defined by the nozzle plate 23 and the valve seat 29 wherein fuel flows into the turbulence cavity through the supply passage 15 and out from the turbulence cavity through the plurality of orifice holes 39 (figures 3 and 4). The nozzle plate includes a second edge (formed by step between layer 36 and channel 35), and the channel 35 is adjacent to orifice holes 39 (figure 4).

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

6. Claims 1-3, 5, 6, 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Harata et al. (U.S. Patent No. 6,405,946)

Harata disclose a fuel injector nozzle assembly comprising: an injector body 11 including a valve seat 14 with a supply passage 50 through which fuel flows generally along a supply axis, the valve seat 14 presenting an upper surface 14a adapted to engage a valve 21 to seal the supply passage 50, and a nozzle plate 25 laser welded (see column 3, lines 24, 25) onto the valve seat 14 including a plurality of orifice holes 25a-25c therein through which fuel flows, the valve seat 14 further including a first edge protrusion, protruding into

the fuel flow for generating a first separation of the fuel flow, thereby creating a plurality of small eddies which are entrained within the fuel flowing adjacent thereto; a turbulence cavity by line 201 defined by the nozzle plate and the valve seat wherein fuel flows into the turbulence cavity through said supply passage and out from the turbulence cavity through the plurality of orifice holes 25a -25c.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuchs et al. or Harata et al. in view of Buchholz et al.

Fuchs et al. or Harata et al. teaches all the limitations of the claims except for conical orifice holes. However, Buchholz et al. discloses a fuel injector having a nozzle plate 23 with conical shaped orifice holes 41 (figures 4 and 5). Therefore, it would have been obvious to one having ordinary skill in the art to have provided the device of Fuchs et al. or Harata et al. with conical orifice holes as suggested by Buchholz. Doing so would provide a fine fuel atomization (column 2, line 13).

With respect to claim 4, to have the nozzle assembly made of stainless steel is obvious to one having ordinary skill in the art and just a matter of design choice.

***Allowable Subject Matter***

9. Claims 18-29 are allowed

**Conclusion**

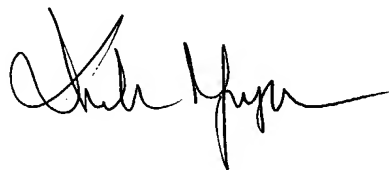
10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to show the art with respect to a fuel injector:

Heyse et al., and Harata et al.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dinh Q Nguyen whose telephone number is 703-305-0248. The examiner can normally be reached on Mon-Fri 6:30-4:00 alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Mar can be reached on 703-308-2087. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Dinh Q Nguyen  
Primary Examiner  
Art Unit 3752